

WHAT IS CLAIMED IS:

1. A method of decomposing an organic azide, comprising:

allowing an organic azide to contact a catalyst that comprises a metal halide, main group halide, mixed metal-main group halide, or mixture thereof.

2. A method as recited in claim 1, wherein the organic azide has the formula



where R is an organic group selected from the group consisting of alkyl, alkyl amino, nitrogen-containing heterocyclic-substituted alkyl, and alkyl amine substituted with at least one alkyl azide group.

3. A method as recited in claim 1, wherein the organic azide is 2-dimethylaminoethyl azide.

4. A method as recited in claim 2, wherein R is a nitrogen-containing heterocyclic-substituted alkyl group.

5. A method as recited in claim 2, wherein R is an alkyl amine substituted with at least one alkyl azide group.

6. A method as recited in claim 1, wherein the catalyst comprises a transition metal halide.

7. A method as recited in claim 6, wherein the transition metal in the transition metal halide can have one or more formal oxidation states.

8. A method as recited in claim 6, wherein the transition metal in the transition metal halide is present in its highest formal oxidation state.

9. A method as recited in claim 1, wherein the catalyst comprises an iron halide or a mixture of iron halide and a second catalyst.

10. A method as recited in claim 1, wherein the catalyst comprises a transition metal chloride.

11. A method as recited in claim 10, wherein the transition metal chloride comprises iron (III) chloride, iron (II) chloride, or a combination of iron (III) chloride and iron (II) chloride.

12. A method as recited in claim 1, wherein the catalyst comprises an iron chloride in combination with a second catalyst.

13. A method as recited in claim 1, wherein the catalyst is dispersed on a support.

14. A method as recited in claim 13, wherein the support comprises a second organic halide decomposition catalyst.

15. A method as recited in claim 1, wherein the catalyst is granular.

16. A method as recited in claim 15, wherein the catalyst is mixed with a different granular catalyst.

17. A method as recited in claim 15, wherein the catalyst is mixed with non-catalyst granules.

18. A fuel source comprising:  
an organic azide having the formula



where R is an organic group selected from the group consisting of alkyl, alkyl amino, nitrogen-containing heterocyclic-substituted alkyl, and alkyl amine substituted with at least one alkyl azide group; and

(b) a catalyst capable of decomposing the organic azide, said catalyst comprising at least one metal halide, main group halide, mixed metal-main group halide, or mixture thereof.

19. A fuel source as recited in claim 18, wherein the organic azide is 2-dimethylaminoethyl azide.

20. A fuel source as recited in claim 18, wherein R is a nitrogen-containing heterocyclic-substituted alkyl group.

21. A fuel source as recited in claim 18, wherein R is an alkyl amine substituted with at least one alkyl azide group.

22. A fuel source as recited in claim 18, wherein the catalyst comprises a transition metal halide.

23. A fuel source as recited in claim 22, wherein the transition metal in the transition metal halide can have one or more formal oxidation states.

24. A fuel source as recited in claim 22, wherein the transition metal in the transition metal halide is present in its highest formal oxidation state.

25. A fuel source as recited in claim 18, wherein the catalyst comprises an iron halide or a mixture of iron halide and a second catalyst.

26. A fuel source as recited in claim 18, wherein the catalyst comprises a transition metal chloride.

27. A fuel source as recited in claim 26, wherein the transition metal chloride comprises iron (III) chloride, iron (II) chloride, or a combination of iron (III) chloride and iron (II) chloride.

28. A fuel source as recited in claim 18, wherein the catalyst comprises an iron chloride in combination with a second catalyst.

29. A fuel source as recited in claim 18, wherein the catalyst is dispersed on a support.

30. A fuel source as recited in claim 29, wherein the support comprises a second organic halide decomposition catalyst.

31. A fuel source as recited in claim 18, wherein the catalyst is granular.

32. A fuel source as recited in claim 31, wherein the catalyst is mixed with a different granular catalyst.

33. A fuel source as recited in claim 31, wherein the catalyst is mixed with non-catalyst granules.